

What is claimed is:

1. An electrochemical cell, comprising:

a) an anode;

5 b) a cathode, wherein at least one of the anode and the cathode is characterized as having been formed by a method consisting essentially of:

10 i) positioning a first electrode active material into a pressing fixture;

ii) positioning a current collector screen on top of the first electrode active material;

15 (iii) positioning a second electrode active material different than the first electrode active material on top of the current collector screen, thereby forming an electrode assembly; and

20 iv) pressing the electrode assembly to form the electrode; and

c) a separator electrically insulating the anode from the cathode; and

25 d) an electrolyte activating the anode and the cathode.

2. The electrochemical cell of claim 1 wherein the first electrode active material in an un-cohesive state is of a first size less than a second size of at least one opening of the current collector screen and capable of moving through the at least one opening, and wherein the first electrode active material is in a cohesive form incapable of moving through the at least one opening in the current collector screen and wherein the

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- second electrode active material is in a form incapable of moving through the at least one opening in the current collector screen, and the electrode assembly is characterized as having been pressed from the direction of either the first electrode active material to the second electrode active material or from the direction of the second electrode active material to the first electrode active material.
- 10 3. The electrochemical cell of claim 1 wherein the second electrode active material is in a form selected from the group consisting of a powder form, a pellet form and a sheet form.
- 15 4. The electrochemical cell of claim 1 wherein the first and the second electrode active materials are selected from the group consisting of  $\text{CF}_x$ ,  $\text{Ag}_2\text{O}_2$ ,  $\text{CuF}$ ,  $\text{Ag}_2\text{CrO}_4$ ,  $\text{MnO}_2$ ,  $\text{SVO}$ ,  $\text{CSVO}$ ,  $\text{V}_2\text{O}_5$ ,  $\text{LiCoO}_2$ ,  $\text{LiNiO}_2$ ,  $\text{LiMn}_2\text{O}_4$ ,  $\text{CuO}_2$ ,  $\text{TiS}_2$ ,  $\text{Cu}_2\text{S}$ ,  $\text{FeS}$ ,  $\text{FeS}_2$ , copper oxide, copper vanadium  
20 oxide, and mixtures thereof.
5. The electrochemical cell of claim 1 wherein the anode is composed of lithium.
- 25 6. The electrochemical cell of claim 1 wherein the electrolyte is of a nonaqueous chemistry comprising a first solvent selected from the group consisting of tetrahydrofuran (THF), methyl acetate (MA), diglyme, trigylme, tetragylme, dimethyl carbonate (DMC),  
30 1,2-dimethoxyethane (DME), 1,2-diethoxyethane (DEE), 1-ethoxy, 2-methoxyethane (EME), ethyl methyl carbonate, methyl propyl carbonate, ethyl propyl carbonate, diethyl

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carbonate, dipropyl carbonate, and mixtures thereof, and the second solvent is selected from the group consisting of propylene carbonate (PC), ethylene carbonate (EC), butylene carbonate, acetonitrile, dimethyl sulfoxide, 5 dimethyl, formamide, dimethyl acetamide,  $\gamma$ -valerolactone,  $\gamma$ -butyrolactone (GBL), N-methyl-pyrrolidinone (NMP), and mixtures thereof.

7. The electrochemical cell of claim 1 wherein the 10 electrolyte is of a nonaqueous chemistry and includes a lithium salt selected from the group consisting of  $\text{LiPF}_6$ ,  $\text{LiBF}_4$ ,  $\text{LiAsF}_6$ ,  $\text{LiSbF}_6$ ,  $\text{LiClO}_4$ ,  $\text{LiO}_2$ ,  $\text{LiAlCl}_4$ ,  $\text{LiGaCl}_4$ ,  $\text{LiC}(\text{SO}_2\text{CF}_3)_3$ ,  $\text{LiN}(\text{SO}_2\text{CF}_3)_2$ ,  $\text{LiSCN}$ ,  $\text{LiO}_3\text{SCF}_3$ ,  $\text{LiC}_6\text{F}_5\text{SO}_3$ ,  $\text{LiO}_2\text{CCF}_3$ ,  $\text{LiSO}_6\text{F}$ ,  $\text{LiB}(\text{C}_6\text{H}_5)_4$ ,  $\text{LiCF}_3\text{SO}_3$ , and mixtures 15 thereof.

8. The electrochemical cell of claim 1 wherein the current collector screen is selected from the group consisting of stainless steel, titanium, tantalum, 20 platinum, gold, aluminum, cobalt nickel alloys, highly alloyed ferritic stainless steel containing molybdenum and chromium, and nickel-, chromium-, and molybdenum-containing alloys.

9. The electrochemical cell of claim 8 wherein the current collector is titanium having a coating selected from the group consisting of graphite/carbon material, iridium, iridium oxide and platinum provided thereon. 25

10. The electrochemical cell of claim 1 wherein the at least one electrode is a cathode having the configuration: 30

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SVO/current collector screen/CF<sub>x</sub>

11. The electrochemical cell of claim 10 wherein the anode is of lithium and the SVO faces the anode.

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12. An electrochemical cell, comprising:

a) an anode;

b) a cathode, wherein at least one of the anode and the cathode is characterized as having been formed by a method consisting essentially of:

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i) positioning a first electrode active material into a pressing fixture;

ii) positioning a first current collector screen on top of the first electrode active material;

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iii) positioning a second electrode active material on top of the first current collector screen;

iv) positioning a second current collector screen on top of the second electrode active material;

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v) positioning a third electrode active material on top of the second current collection screen, thereby forming an electrode assembly; and

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vi) pressing the electrode assembly to form the electrode; and

c) a separator electrically insulating the anode from the cathode; and

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d) an electrolyte activating the anode and the cathode.

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13. The electrochemical cell of claim 12 wherein the first and the third electrode active materials are the same and they are different than the second electrode  
5 active material.

14. The electrochemical cell of claim 12 wherein the at least one electrode is a cathode having the configuration:  
10 SVO/current collector screen/CF<sub>x</sub>/current collector screen/SVO.

15. The electrochemcial cell of claim 12 wherein when the first and third electrode active materials are in an  
15 un-cohesive state, they are of an un-cohesive size less than an opening size of at least one opening of the current collector screen and capable of moving through the at least one opening, and wherein the first and third electrode active materials are in a cohesive form  
20 incapable of moving through the at least one opening in the current collector screen and wherein the second electrode active material is in a form incapable of moving through the at least one opening in the current collector screen, and the electrode assembly is  
25 characterized as having been pressed from the direction of either the first electrode active material to the third electrode active material or from the direction of the third electrode active material to the first electrode active material.

30 16. The electrochemical cell of claim 12 wherein the second electrode active material is in a form selected

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from the group consisting of a powder form, a pellet form and a sheet form.

17. The electrochemical cell of claim 12 wherein the first, the second and the third electrode active materials are selected from the group consisting of  $\text{CF}_x$ ,  $\text{Ag}_2\text{O}_2$ ,  $\text{CuF}$ ,  $\text{Ag}_2\text{CrO}_4$ ,  $\text{MnO}_2$ ,  $\text{SVO}$ ,  $\text{CSVO}$ ,  $\text{V}_2\text{O}_5$ ,  $\text{LiCoO}_2$ ,  $\text{LiNiO}_2$ ,  $\text{LiMn}_2\text{O}_4$ ,  $\text{CuO}_2$ ,  $\text{TiS}_2$ ,  $\text{Cu}_2\text{S}$ ,  $\text{FeS}$ ,  $\text{FeS}_2$ , copper oxide, copper vanadium oxide, and mixtures thereof.

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18. A method for manufacturing an electrode for an electrochemical cell, comprising the steps of:

- a) positioning a first electrode active material into a pressing fixture;
- 15 b) positioning a first current collector screen on top of the first electrode active material;
- c) positioning a second electrode active material different than the first electrode active material on top of the first current collector screen, thereby forming an electrode assembly; and
- 20 d) pressing the electrode assembly to form the electrode.

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19. The method of claim 18 wherein the first electrode active material in an un-cohesive state is of a first size less than a second size of at least one opening of the first current collector screen and capable of moving through the at least one opening, and including providing the first electrode active material in a cohesive form incapable of moving through the at least

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- one opening in the first current collector screen and further providing the second electrode active material being in a form incapable of moving through the at least one opening in the first current collector screen, and
- 5 pressing the electrode assembly from the direction of either the first electrode active material to the second electrode active material or from the direction of the second electrode active material to the first electrode active material.
- 10 20. The method of claim 18 including providing the second electrode active material in a form selected from the group consisting of a powder form, a pellet form and a sheet form.
- 15 21. The method of claim 18 wherein the first electrode active material is not a powder in its cohesive form.
- 20 22. The method of claim 18 including providing the at least one electrode as a cathode having the configuration:  
SVO/current collector screen/CF<sub>x</sub>
23. The method of claim 18 including providing the
- 25 electrode assembly further comprising:
- a) positioning a second current collector screen on top of the second electrode active material;
- b) positioning a third electrode active material on top of the second current collection screen, thereby forming the
- 30 electrode assembly; and

- c) pressing the electrode assembly to form the electrode.

24. The method of claim 23 including selecting the first, the second and the third electrode active materials from the group consisting of  $\text{CF}_x$ ,  $\text{Ag}_2\text{O}$ ,  $\text{Ag}_2\text{O}_2$ ,  $\text{CuF}$ ,  $\text{Ag}_2\text{CrO}_4$ ,  $\text{MnO}_2$ ,  $\text{SVO}$ ,  $\text{CSVO}$ ,  $\text{V}_2\text{O}_5$ ,  $\text{LiCoO}_2$ ,  $\text{LiNiO}_2$ ,  $\text{LiMn}_2\text{O}_4$ ,  $\text{CuO}_2$ ,  $\text{TiS}_2$ ,  $\text{Cu}_2\text{S}$ ,  $\text{FeS}$ ,  $\text{FeS}_2$ , copper oxide, copper vanadium oxide, and mixtures thereof.
25. The method of claim 23 wherein the first and the third electrode active materials are the same and they are different than the second electrode active material.
26. The method of claim 23 including providing the at least one electrode as a cathode having the configuration:  
SVO/current collector screen/ $\text{CF}_x$ /current collector screen/SVO.

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